

MUGIL POECILUS DAY, SAME AS  
MUGIL TROSCHELI BLEEKER

BY

T. V. R. PILLAY

I.C.I. (India) Research Fellow of the National Institute of  
Sciences of India

(From the Laboratories of the Zoological Survey of India, Calcutta)

(With a plate)

INTRODUCTION

Day (1865 *a*) described for the first time, from Cochin, the spotted Grey Mullet, *Mugil poecilus*. Though Day (1889) has given Bombay and Western Coast of India as the habitat of the species, there are not many records of its occurrence in this area. It has since been recorded from Bombay waters by Spence & Prater (1931). I had opportunities of collecting specimens referable to this species from its type locality, viz. Cochin and also from the backwaters of Ennore, near Madras, and the study of these specimens showed their close similarity with *M. troscheli* Blkr. A single specimen of *M. poecilus* in the collections of the Bombay Natural History Society was also obtained and examined in detail. These studies revealed some interesting facts about the identity of *M. poecilus*.

DISTINGUISHING CHARACTERS OF *Mugil poecilus* DAY

A comparison of Day's (1865 *a*) original description of *M. poecilus* with Bleeker's (1858) description of *M. troscheli* shows that Day distinguished this species from *M. troscheli* only by the presence of deep central black spots on its body. He laid considerable stress on the diagnostic importance of the black spots and mentioned that 'each scale on the body and the base of the fins in the adult fish' has 'a gland in its centre of a deep black colour'. He also pointed out that 'in the young fish these glands are not so apparent; and until they reach about three inches the black central spots on the scales do not commence to show themselves; but still each scale is marked by a central cavity of a rounded shape, but very irregular in size.' As regards the adipose eyelids he stated that it 'covers a little more than one-third of the eye on either side in the adult fish. In the young the anterior curtain is much broader than the posterior one'.

Day (1865 *b*) in his work: 'The Fishes of Malabar' described another species of Grey Mullet, *Mugil cunnambo* which he later (Day, 1878) considered the same as *M. poecilus*, but without black spots, having instead brownish stripes along each row of scales. He was of the opinion that this is the adult form, but he also mentioned that in some of his specimens two-thirds grown, a very few black spots are apparent.

A comparison of the descriptions of *M. poecilus* and *M. troscheli* in Day's later work (1889) shows that he distinguished them by the following characters:—

<i>M. troscheli</i>	<i>M. poecilus</i>
C. 15 Pyloric caeca 4	C. 14 Pyloric caeca 5
No adipose eyelids.	Moderately broad posterior adipose and a narrow anterior one.
Eye situated one diameter from end of snout.	Eye situated $\frac{3}{4}$ diameter from end of snout.
First and second dorsals commence above 9th and 18th scales of Ll. respectively.	First and second dorsals commence above 10th and 20th scales of Ll. respectively.
Caudal lunate.	Caudal emarginate.
Dark spots not present on scales.	Dark spots present on scales.

Reference to the descriptions of *M. troscheli* given by Weber & de Beaufort (1922), Oshima (1922), Whitehouse (1922), Peter Deva-sundaram (1951) and Chandy (1951) shows that the only diagnostic characters of importance are, the size of the adipose eyelids which according to Weber & de Beaufort are only 'rudimentary developed', the commencement of the first dorsal below the 11th or 12th lateral line scale in *M. troscheli* instead of below the 10th lateral line scale as in *M. poecilus*, and the presence of dark spots on the scales of *M. poecilus*. Reference to the figures of *M. poecilus* in Day's 'Fishes of Malabar' 1865, Pl. IX and 'Fishes of India' 1878, Pl. LXXV, Fig. 4, would show that the adipose eyelids are not well developed and are only vestigial. In the specimens examined by me the number of pyloric caecae have been found to be the same in both the species, viz. five. Thus it will be seen that the only characters that could be considered helpful in distinguishing *M. poecilus* from *M. troscheli* in the descriptions are: the presence of black spots on the scales and the relative position of the first dorsal fin.

## MORPHOMETRIC AND BIOMETRIC COMPARISON OF

*M. poecilus* AND *M. troscheli*

In the present study twelve specimens of *M. troscheli* collected from Ennore (Madras State) and five specimens referable to *M. poecilus* collected from Cochin and one specimen in the collections of the Bombay Natural History Society, from Bombay, were examined in detail. Table I presents the range of morphometric characters of the samples. The characters considered to be of diagnostic importance were biometrically analysed following the method recommended by Simpson and Roe (1939) for small samples, to ascertain whether the individual differences were statistically significant. The results are presented in Table II, and it is evident from the P values that the differences between the samples are not statistically significant.

TABLE I

RANGE OF MORPHOMETRIC CHARACTERS OF *M. troscheli* AND *M. poecilus*

Character	<i>M. troscheli</i>	<i>M. poecilus</i>
Total length/Standard length ...	1.2—1.3	1.2—1.3
Total length/Head length ...	4.7—5.3	4.8—5.0
Total length/Height of body ...	4.9—5.3	5.0
Standard length/Head length ...	3.7—4.4	4.1—4.2
Standard length/Height of body ...	3.9—4.3	3.9—4.0
Standard length/Distance of D1 to the tip of snout ...	1.9—2.2	2.0—2.1
Standard length/Distance of D1 to the tip of snout ...	1.8—1.9	1.9
Length of head/Diameter of eye ...	3.3—4.3	4.0—4.3
Post-orbital distance/Diameter of eye ...	1.8—2.0	2.0
Inter-orbital distance/Diameter of eye ...	1.5—2.0	1.5—1.8
Proportion of anal before the origin of D2 ...	$\frac{1}{3}$ — $\frac{1}{2}$	$\frac{1}{3}$ — $\frac{1}{2}$
Width of anal base/Height of anal ...	$\frac{1}{3}$ — $\frac{1}{2}$	$\frac{1}{3}$ — $\frac{1}{2}$
Diameter of eye/Total width of adipose eyelids ...	2.9—6.3	2.7—5.0
Length of head/Height of D1 ...	1.5—1.8	1.5—1.6
Length of Head/Length of chin space ...	1.3—1.7	1.7—1.9
Length of Head/Length of pectoral fin ...	1.3—1.7	1.3—1.5
Mandibular angle ...	120	120
Length of chin space/Width of chin space ...	1.6—3.5	6.0—7.5
Height of D1/Height of D2 ...	1.0—1.2	1.0
Number of Lateral line scales ...	30—33	30—31
Ll. scale below D1 ...	10—12	10—11
Ll. scale below D2 ...	20—23	20—21
Ll. scale above Pectoral fin ...	6—8	7—8
Ll. scale above anal fin ...	18—21	18
Ll. scale above ventral fin ...	5—6	5—6
Ltr. scales ...	10—11	10
Length of caudal peduncle/Least height of caudal peduncle ...	1.0—1.3	1.1—1.3



TABLE II

BIOMETRIC COMPARISON OF *M. troscheli* AND *M. poecilus*

Character	Mean		Standard deviation		Standard error		t	P.
	I	II	I	II	I	II		
Diameter of eye/Width of adipose ...	4.163	3.850	1.162	1.628	0.411	1.151	0.294	>0.10
L1. ...	31.667	30.550	0.883	0.707	0.266	0.500	1.315	>0.10
L1. below D 1 ...	10.917	10.500	0.520	0.707	0.157	0.500	0.541	>0.10
L1. below D 2 ...	21.818	20.500	0.874	0.707	0.276	0.500	0.423	>0.10
L1. above anal ...	19.178	19.000	0.888	1.000	0.258	0.709	0.718	>0.10

Note.—Nos. I and II above refer to *M. troscheli* and *M. poecilus* respectively.

THE IDENTITY OF THE DARK SPOTS ON *Mugil poecilus*

From the comparison of the morphometry of *M. troscheli* and *M. poecilus* it emerges that the only significant difference between the two species is the presence of dark spots on the scales of the latter. But Day (1865 *b*) himself has mentioned that all adults of the species do not have the dark spots. Though in the figure of *M. poecilus* given in his 'Fishes of Malabar' (1865 *b*, Plate IX) it is shown to have the black spot regularly on every scale, in the 'Fishes of India' (1878, Plate LXXV, Fig. 4), these spots are not shown to be very regular in disposition. The specimens examined by me, both from my own collections and the collections of the Bombay Natural History Society, had them absolutely irregular, scattered over the body. The spots could easily be removed and on their removal, prominent depressions could be seen in their original places, varying from minute spots to fairly large ones of about 3 mm. diameter. A careful examination of the removed bodies, which were more or less hemispherical, revealed that they were actually groups of certain unicellular algae, growing in rather close apposition on the fish scales, giving the superficial appearance of dark spots. An attempt was made to determine the algae, but it was soon realised that it is necessary to culture them and study them in their living condition also for their identification. This work has not been possible for want of suitable fresh material.

Of the three types of algal associations with animals, observed in Indian waters (Biswas, 1936), the present one appears to be of the first type, viz., simple association of algae growing on animal body which forms a suitable substratum.

Obviously, as is clear from the evidence presented above, *M. poecilus* is the name Day gave to young specimens of *M. troscheli* most of which had the algal association. His statement (Day, 1865 *a*) that though

*M. poecilus* is 'by no means rare at times, in some years they almost absent themselves'; indicates that probably this algal association occurs only during certain seasons of the year. His observation (Day, 1865 b) that the dark spots are generally seen only on young and half-grown specimens suggests that large-sized specimens of *M. troscheli* are comparatively free from algal associations. The largest specimen with these dark spots, I have examined, was 17.1 cm. in total length. In this connection it may be added that such algal growths have been observed on certain other species of mullets also from Cochin.

#### SYNONYMY

As *M. poecilus* Day (Figs. 1 & 2) has now proved to be synonymous with *M. troscheli* Blkr. (Fig. 3), the synonymy of the latter species will be as follows:—

#### *M. troscheli* Blkr.

*Mugil troscheli* Bleeker, *Nat. Tijdschar. Ned. Ind.* xvi, 1858, p. 277  
Günther, *Cat. Brit. Mus.*, III, 1861, p. 448 Day, *Fish. Brit. India*,  
2, 1889, p. 355.

*Mugil troscheli* (Sic) Day, *Fish. India*, 1878, p. 358.

*Mugil troscheli* Bleeker, *Act. Soc. Sci. Indo-Neerl.*, VIII, 1860, p. 80.

*Liza troscheli* Kendall & Goldsborough, *Mem. Mus. Comp. Zool. Harv. Coll.*, xxvi, No. 7, 1911, p. 256. Whitehouse, *Madr. Fish. Bull.*, xv, 1922, p. 89.

*Liza troscheli*, Jordan & Evermann, *Proc. U.S. Nat. Mus.*, xxv, 1903, p. 332.

Jordan & Seale, *Bull. U.S. Bur. Fish.*, xxvi, 1906, p. 11.

Jordan & Richardson, *Bull. U.S. Bur. Fish.*, xxvii, 1908, p. 244.

Smith & Seale, *Proc. Biol. Soc. Wash.*, xix, p. 76.

Seale & Bean, *Proc. U.S. Nat. Mus.*, xxxiii, 1907, p. 240.

Jordan & Richardson, *Mem. Carneg. Mus.*, iv, No. 4, 1909, p. 176.

Jordan & Starks, *Proc. U.S. Nat. Mus.*, xxxii, 1912, p. 494, *Ann. Carneg. Mus.*, xi, Nos. 3 and 4, 1917, p. 439.

Oshima, *Ann. Carneg. Mus.*, xii, 1919, Nos. 2 and 4, p. 274; *Ann. Carneg. Mus.*, xiii, 1922, Nos. 3 and 4, p. 256.

*Mugil poecilus* Day, *Proc. Zool. Soc. Lond.*, 1865, p. 33; *Fish. Malabar*, 1865, p. 140; *Fish. India*, 1878, p. 351.

*Mugil poecilus* Day, *Fish. Brit. India*, II, 1889, p. 345.

*Mugil cunnambo* Day, *Fish. Malabar*, 1865, p. 141.

#### SUMMARY

A close comparison of the descriptions of *M. troscheli* Blkr. and *M. poecilus* Day contained in relevant literature shows that very few differences, except for the occurrence of black spots on the scales of the latter, have been noticed. The morphometry of specimens examined is presented. A biometric comparison of characters of diagnostic importance failed to show any significant differences. Thus it was found that the occurrence of black spots is the only character



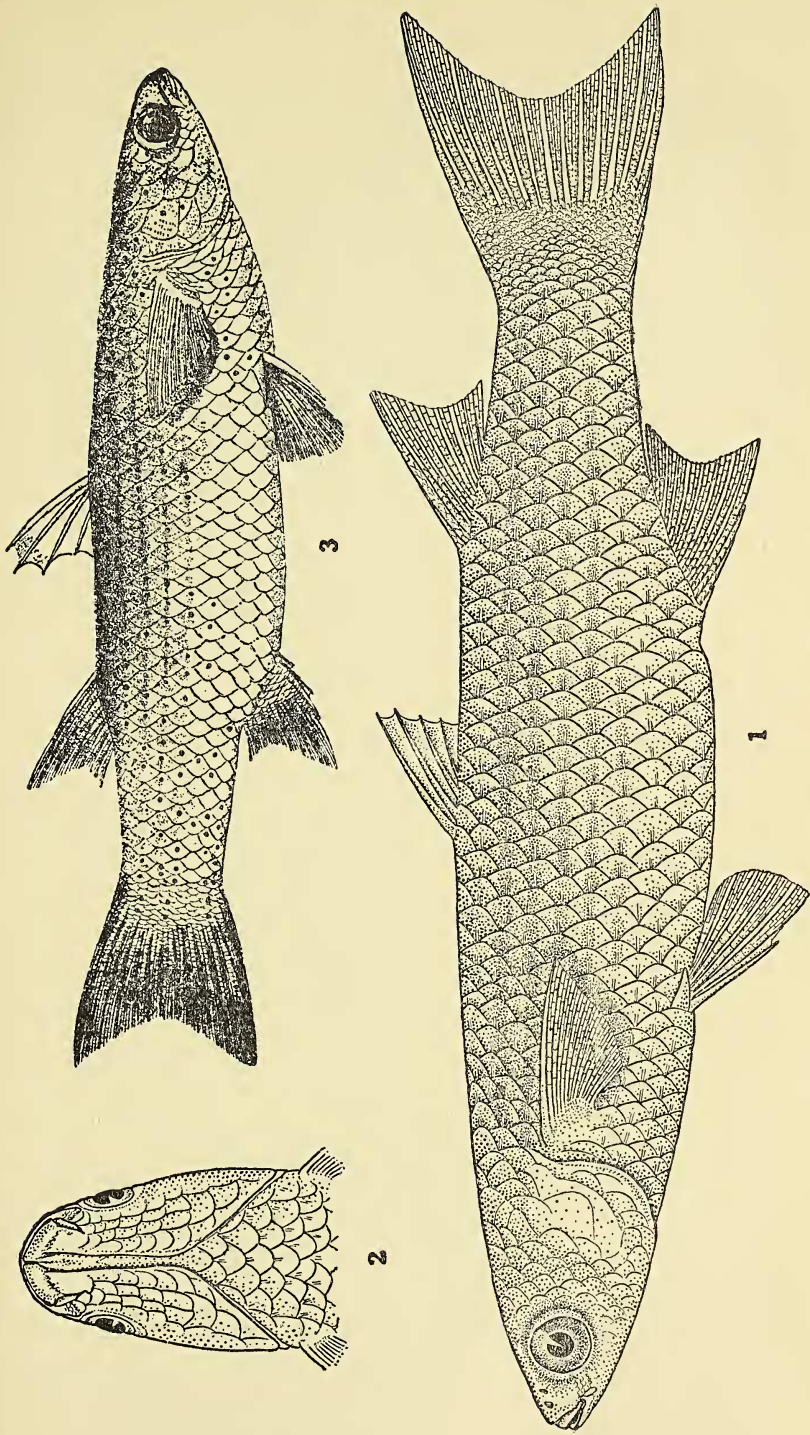


Fig. 1. Lateral view of *Mugil troscheli* Blkr.  $\times 4/5$ .  
Fig. 2. Ventral view of the head of *Mugil troscheli* Blkr.  $\times 4/5$ .  
Fig. 3. Lateral view of *Mugil poecilus* Day. (from Day, 1878)  $\times 4/5$ .